Copepods Collected along 13°E Longitude of the Antarctic Ocean in the 1973 Summer

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1973 年夏季，南極海インド洋区の東経 13° 線に沿って得られたカイアシ類資料

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要旨: 1973年2月27日から3月3日の間，南極海インド洋区の東経 13° 線に沿った南緯 51° 以南の8観測点において採集したカイアシ類の種組成を調査した．採集は，ノルパックネット（口径 45 cm，目合 0.33 mm）を用いて水深 200 m から表面までの鉛直曳によって行われた．各測点ともカイアシ類が最も卓越して出現し，動物プランクトン総個体数の 80% 以上を占めた．Oncaeidae を除く 13 属 15 種類のカイアシ類が同定され，*Calanus propinquus*, *Calanoides acutus*, *Ctenocalanus vanus* および *Oithona similis* は優占して出現した．*C. propinquus*, *C. acutus* および *C. vanus* は南緯 60° から 63° 付近で卓越して出現した．また，*O. similis* は南緯 56° および 62° 付近で多く出現した．その他，*Calanus simillimus*, *Rhincalanus gigas*, *Clausocalanus laticeps*, *Euchirella rostromagna*, *Euchaeta antarctica*, *Racovitzanus antarcticus*, *Scolecithricella glacialis*, *Metridia lucens*, *Metridia gerlachei*, *Heterorhabdus austrinus* および *Haloptilus oxycephalus* の 11 種の出現個体数はわずかであった．

Abstract: Zooplankton samplings were conducted at 8 stations in the Indian sector of the Antarctic Ocean along 13°E from 27 February to 3 March in 1973 by the 14th Japanese Antarctic Research Expedition. Vertical hauls from 200 m to the surface with a Norpac net (45 cm in diameter, 0.33 mm mesh openings) were carried out. Copepoda occupied more than 80% of the total individual numbers of zooplankton at all stations. The species composition and abundance of copepods were investigated. A total of 15 species except for Oncaeidae were recorded. *Calanus propinquus*, *Calanoides acutus*, *Ctenocalanus vanus* and *Oithona similis* were numerically important components. Especially *C. propinquus*, *C. acutus* and *C. vanus* occurred abundantly at three stations between 60°S and 63°S and *O. similis* was abundant near 56°S and 62°S. Other eleven species, *Calanus simillimus*, *Rhincalanus gigas*, *Clausocalanus laticeps*, *Euchirella rostromagna*, *Euchaeta antarctica*, *Racovitzanus antarcticus*, *Scolecithricella glacialis*, *Metridia lucens*, *Metridia gerlachei*, *Heterorhabdus austrinus* and *Haloptilus oxycephalus* were small in numbers.

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南極資料, Vol. 35, No. 2, 155-160, 1991
Nankyoku Shiryô (Antarctic Record), Vol. 35, No. 2, 155-160, 1991

1. Introduction

Several papers on Copepoda fauna in the Indian sector of the Antarctic Ocean based on the collections obtained by Japanese Antarctic Research Expedition (JARE) have been published (TANAKA, 1960, 1964; SENO *et al.*, 1963, 1966; KAWAMURA and HOSHIAI, 1969; NAKAMURA *et al.*, 1982). However, as these investigations have been restricted to the north of Lützow-Holm Bay around 40°E, our knowledge of species composition and abundance of copepods in the west of Lützow-Holm Bay is scarce and insufficient. In this paper we report the species composition and abundance of planktonic copepods in the Antarctic Ocean south of Polar Front along 13°E, where plankton net samplings were carried out as part of the marine biological research program on board the icebreaker FUJI.

2. Materials and Methods

Plankton samplings were carried out in the Indian sector of the Antarctic and the Subantarctic waters during the summer season in 1972–1973 by JARE-14 (*cf.* FUKUCHI and TANIMURA, 1981). Samples were collected by vertical hauls from 200 m to the surface with a Norpac net (45 cm in diameter, 0.33 mm mesh openings) at 33 stations. Eight samples out of 33, which were collected in the south of 51°S along 13°E from 27 February to 3 March in 1973, are dealt with in this report (Fig. 1). Copepods

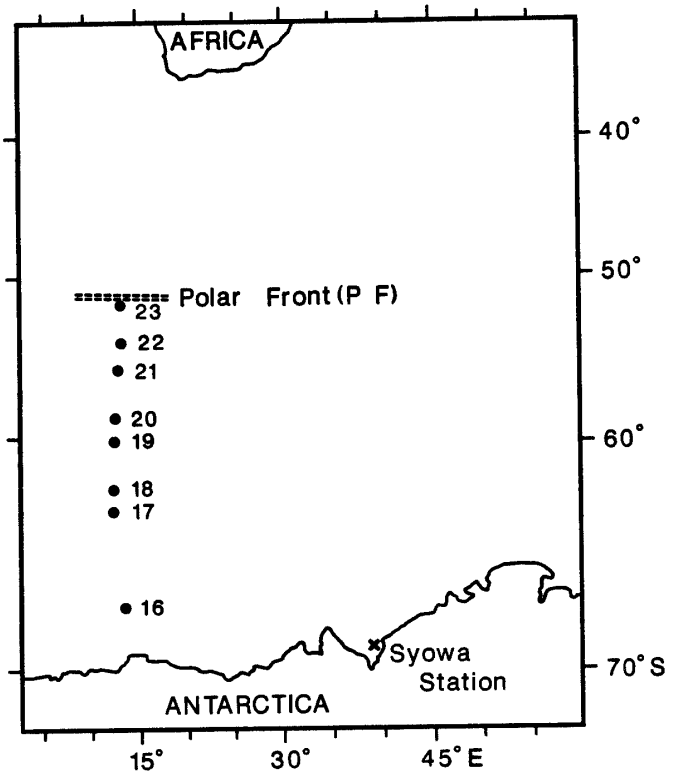

Fig. 1. Location of sampling stations occupied by the 14th Japanese Antarctic Research Expedition (JARE-14) from 27 February to 3 March, 1973. Station numbers are the same as those in FUKUCHI and TANIMURA (1981).

were sorted from 1/2 to 1/32 aliquot of the eight samples. Species identification and enumeration were done under a binocular microscope. The filtering volume in each haul was calculated on the assumption of 100% filtration efficiency of the net and all counts were converted into the density expressed as individuals per 1 m^3 of water. Data on water temperature and salinity were cited from SUGITA and IWANAGA (1974).

3. Results and Remarks

Total zooplankton abundance and vertical profile of water temperature and salinity in the upper 200-m layer along the 13°E section are shown in Fig. 2. KURODA and FUKUCHI (1982) reported that Polar Front was located in the vicinity of 51°S in this season. The temperature minimum layer of less than −1°C was observed between 75 m and 150 m and its northern limit reached 53°S. Low salinity surface water less than 34.5‰ extended to north of the northern end of the temperature minimum. Low temperature and low salinity in the surface water in this region would be influenced by outflow of Weddell Gyre (GORDON, 1988). Zooplankton abundance

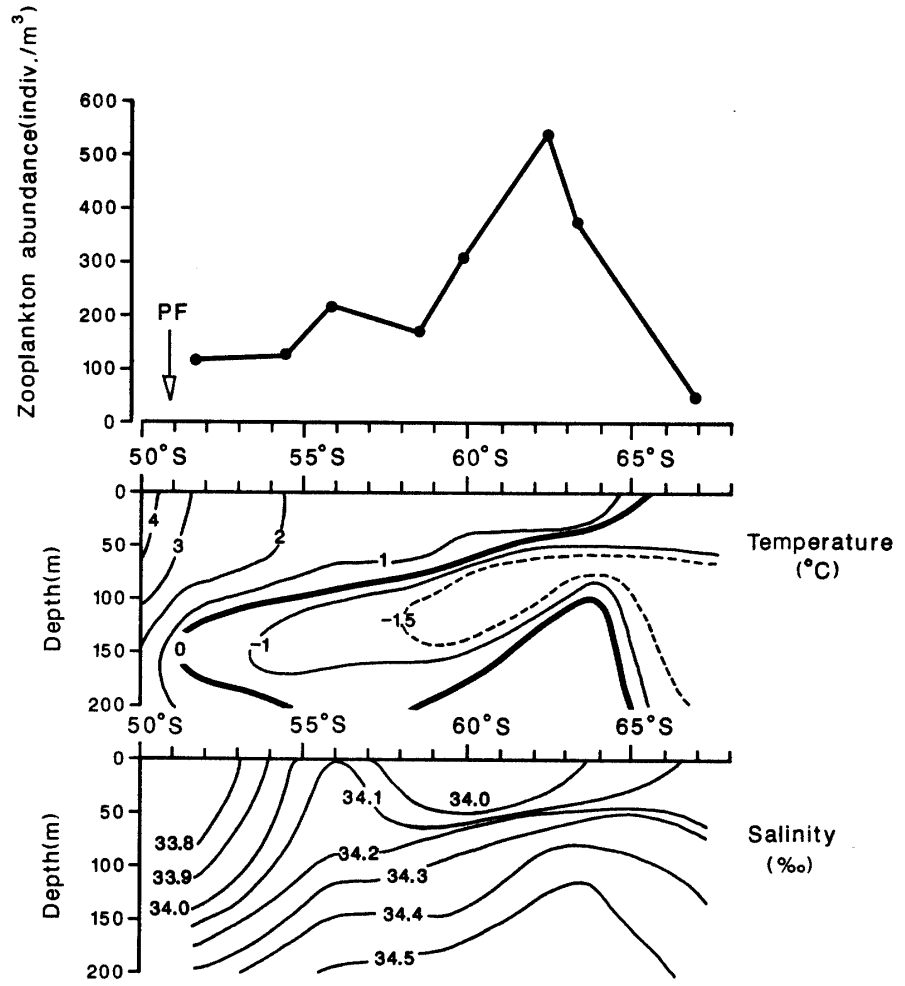

Fig. 2. Zooplankton abundance (upper), vertical section of water temperature (middle) and salinity (lower) in the upper 200-m layer along 13°E from 27 February to 3 March, 1973. PF: Polar Front.

Table 1. List of planktonic copepod species collected with a Norpac net (45 cm in diameter, 0.33 mm mesh openings) in the Indian secter of the Antarctic Ocean along 13°E longitude from 27 February to 3 March 1973. Figures show the number of individuals per m^3.

Stn. No.	16	17	18	19	20	21	22	23
Position	67°05′S 13°43′E	63°21′S 12°37′E	62°15′S 12°51′E	59°52′S 12°53′E	58°29′S 12°57′E	55°49′S 13°07′E	54°24′S 13°25′E	51°46′S 13°29′E
Calanus propinquus	9.8	56.5	107.6	91.3	21.4	10.6	4.7	28.8
Calanus simillimus	0	0	0	0	0	0	0	0.7
Calanoides acutus	2.3	155.6	145.6	106.4	29.0	4.2	3.3	13.7
Rhincalanus gigas	0.1	0	13.6	9.4	10.5	0.4	0.2	3.0
Clausocalanus laticeps	0	0	0	0	0	0	0	2.6
Ctenocalanus vanus	0.9	76.9	127.4	59.0	62.7	65.5	34.8	10.7
Euchirella rostromagna	0	0.6	0.4	0	0	0	0	0
Euchaeta antarctica	0.1	0	0	0.3	0.3	0	0.3	0.1
Racovitzanus antarcticus	0	0	1.2	0	0	0	0	0
Scolecithricella glacialis	0.4	6.0	7.0	6.3	9.0	4.2	2.5	3.9
Metridia gerlachei	9.5	5.0	19.0	6.3	5.6	3.5	6.4	0.6
Metridia lucens	0	0	0	0	0	0	0	29.4
Heterorhabdus austrinus	0.1	0.6	0	0	0	0	0	0.1
Haloptilus oxycephalus	0.1	0	0.4	0.3	0	0	0	0.1
Oithona similis	7.6	59.9	87.4	12.2	18.5	118.2	63.2	17.6
Oncaea spp.	3.4	4.7	7.0	3.5	1.5	0.7	0	0.8
Total	34.3	365.8	516.6	295.0	158.5	207.3	115.4	112.1

was high between 60°S and 63°S and the highest abundance of 541 indiv./m^3 was obtained at Stn. 18 near 62°S, whereas the lowest abundance of 42 indiv./m^3 was seen at the southernmost station, Stn. 16, near 67°S. Copepoda were most dominant zooplankton component, occupying more than 80% of the individual number of zooplankton at all stations. Other than Copepoda 8 zooplankton taxa were identified. They were Polychaeta, Chaetognatha, Euphausiacea, Appendicularia, Ostracoda, Amphipoda, Gastropoda, and Hydrozoa in the order of abundance.

A total of 15 species of copepods except for Oncaeidae were identified; *Calanus propinquus*, *Calanus simillimus*, *Calanoides acutus*, *Rhincalanus gigas*, *Clausocalanus laticeps*, *Ctenocalanus vanus*, *Euchirella rostromagna*, *Euchaeta antarctica*, *Racovitzanus antarcticus*, *Scolecithricella glacialis*, *Metridia gerlachei*, *Metridia lucens*, *Heterorhabdus austrinus*, *Haloptilus oxycephalus* and *Oithona similis*.

The abundance of each copepod species is shown in Table 1. *C. propinquus* and *C. acutus* were dominant species. They occurred abundantly at three stations between 60°S and 63°S. Although the abundance of *R. gigas*, *S. glacialis* and *M. gerlachei* were low (less than 20 indiv./m^3), they were found commonly at all stations. VERVOORT (1965) showed that these species as well as *C. propinquus* and *C. acutus* were typical Antarctic surface species. *C. vanus* and *O. similis* were also numerically important components. *C. vanus* was abundant near 62°S and *O. similis* near 56°S and 62°S. According to TANAKA (1960), they are widely distributed in the oceans from the tropical to the polar regions.

The rest species occurred infrequently. *C. simillimus*, *C. laticeps* and *M. lucens* appeared only at the northernmost station, Stn. 23. VERVOORT (1965) reported that they could be taken as representing characteristic Subantarctic surface species. *E. rostromagna*, *E. antarctica*, *R. antarcticus*, *H. austrinus* and *H. oxycephalus* were small in number (less than 1 indiv./m^3), occurring only in the south of 62°S except for *E. antarctica*. VERVOORT (1965) pointed out that they inhabit deep waters. This may be the main reason why they occurred sporadically and in small numbers.

Acknowledgments

We are grateful to Dr. K. KURODA of National Research Institute of Fisheries Science for providing the plankton samples collected in the 14th Japanese Antarctic Research Expedition (JARE-14). Thanks are also extended to Dr. M. FUKUCHI for his valuable comments and critical reading of the manuscript.

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(Received April 8, 1991; Revised manuscript received May 29, 1991)